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COOP'S TECHNOLOGY DIGEST

-A Timely Report On The World Of Communications-

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COOP'S TECHNOLOGY DIGEST

February 23, 1995 ◆ VOLUME 95-2-15

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MMDS: Where The Action Is

With the sign-on of TVNZ's Regional Television service March 19, Auckland area residents will have over the air access to ten (10) channels of television; five of these, operated by Sky Network, are for a weekly/monthly fee. As recently as 1989, Auckland residents were given two choices; TV1 and TV2.

When deregulation was urged in the television broadcast industry (1988) a number of want-to-be telecasters lined up to carve out their own piece of the pie. Many bid on (and lost) an opportunity to utilise the 1989 opening of UHF (ultra high frequency) channels while others saw some form of "pay television" as the next business opportunity in New Zealand. The SKY Network bid for a nation-wide group of UHF channels, to be used for a New Zealand-unique form of "wireless cable TV" or pay television, would be the first to be operational in this then-new business field.

Less noticed than the UHF broadcast frequencies out up for tender were a group of 12 TV bandwidth channels located between 2300 and 2396 MHz. On 21 July 1990, the Ministry of Commerce issued a notice of Radio Frequency Tendering for these "channels" and on 19 November 1990 the successful bidders were revealed. Of the 12 channels offered for bid, 8 would be "won" by a single company (see box here).

MDS/MMDS is a fully developed pay television service in many portions of the world. It has been especially successful in the United States and throughout South America. And after more than a decade of political and bureaucratic wrangling, it finally came to the South Pacific late in January; the first Australian pay TV services in this frequency region "signed on the air" the 26th of January.

MDS originally meant "Multipoint Distribution Service," MMDS is "Multi-channel multipoint Distribution service." The two are interchangeable in use. In plain English, a frequency range normally considered to be microwave (any frequency above 1,000 MHz is nominally classified as microwave) is configured to function like a VHF or UHF TV transmission channel. In most microwave work, there is a point of transmission, and, one (up to perhaps four) points of reception. In most microwave systems, the signal is tightly focused at the transmitter to travel in a straight (line of sight) path to a specific receiving location. Thus there is point-to-point communication; one designated transmit point or site, one designated receive site. Because microwave frequency beams can be narrowly focused at the transmitter, it is technically possible for many non-related users in the same geographic region to use (and reuse) the same frequency without interference between the respective "systems." The entire world of microwave signalling is built upon this point-to-point (focused beam) premise.

"Broadcasting," on the other hand, means the transmission of signals from a specified transmitter to any receive site that happens to be within reception range. ~~Broadcast (TV and radi~~o)

~~"Broadcasting," on the other hand, means the transmission of signals from a specified transmitter to any receive site that happens to be within reception range~~. Broadcast (TV and radio) transmitters are designed to serve receivers located at any point within the "coverage zone" where as microwave transmission systems limit their coverage to a specific path or point.

MDS FREQUENCY WINNERS/1990

001JJA: 2300-2308 MHz/ BCL
002JJB: 2308-2316 MHz/ Telecom
003JJC: 2316-2324 MHz/ Telecom
004JJD: 2324-2332 MHz/ Telecom
005JJE: 2332-2340 MHz/ Sky
006JJF: 2340-2348 MHz/ Telecom
007JJG: 2348-2356 MHz/ Multiband TV
008JJH: 2356-2364 MHz/ Telecom
009JJI: 2364-2372 MHz/ Multiband TV
010JAJ: 2372-2380 MHz/ Telecom
011JAA: 2380-2388 MHz/ Telecom
012JAB: 2388-2396 MHz/ Telecom

All frequency rights are nation-wide although rights managers may re-parcel use of any of the channels by region or zone as they wish.

MDS was first trialled in North America in 1966. Under the (then) rules of the (US) Federal Communications Commission, it was not legal to license a microwave transmitter to "broadcast." When a microwave radio transmitter application came to the FCC for licensing approval that application had to specify not only the parameters of the transmitter, but also the parameters of the specified receive site(s). Failing this requirement, no licence was granted.

To skirt the edge of the regulations, the first MDS systems tested pretended they were using microwave to serve not one specified receive site (as per the rules) but rather "numerous specified receive sites." The rules allowed this as long as each receive site was clearly specified in the licence application. The first trials of MDS as a television delivery (or pay TV) system went to the FCC with one transmit site specified and up to several hundred clearly designated receive sites.

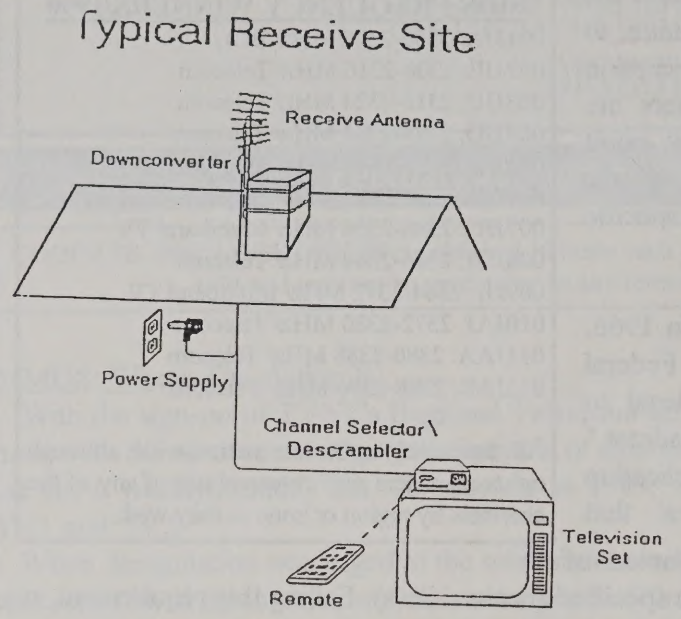
The FCC went along with this minor bending of their rules for several reasons/ including their often stated desire that cable television (by coaxial cable) have some competition. In short order MDS systems were springing up throughout the US, specialised equipment suppliers appeared to provide their unique transmitters and receive systems, and it became clear that MDS could under the right circumstances compete with cable TV as an alternate pay television delivery mechanism. Ultimately the rules were rewritten to allow MDS systems to operate without the illusion that each and every receive site would be specified in this licence application. By 1980, the infant industry that had sprung up around MDS trials was calling itself "Wireless Cable." The young industry started its own trade association and even went so far as to hire as its head the former head of the National Cable Television Association (NCTA), the wired-cable-TV operator's trade association.

During the 1980s America began to export MDS/MMDS technology and hardware. This was a particularly successful venture in South America where US domestic satellite signals could be received and the programming the satellites delivered could be piped around larger cities using the MDS concepts. At this time the MDS operators were satisfied that the microwave frequencies they were employing were sufficiently exotic that no additional "signal security" was required. Only a handful of firms manufactured the hardware, and for the most part the inventory of the receive-site "downconverter" packages was closely controlled. This would later prove to be a soft underbelly for MDS.

How MDS Works

An MDS transmitter is quite similar in appearance to a SKY Network UHF TV transmitter. Unlike SKY, transmitter power levels are quite low (typical transmit units range from 10 watts to 100 watts per channel) and the "system equation" depends upon each receive site to "make up the power difference" by employing relatively high gain receive antennas and an electronic gadget that goes at the receive antenna called a "downconverter" (see illustration here).

Transmitter capital costs and operating costs are held to a minimum by shifting some of the burden of "system gain" away from a (higher power) transmitter to the individual receivers. The ability to do this is a peculiarity of the microwave frequency ranges and is illustrated by the 10-60 watt C-band satellite transmitters in space that cover up to 1/3rd of the earth's surface with very low power. Satellite TV does the same thing as MDS; it reduces the transmit-end power output but in the process increases the design demands for the receive end of the circuit. This means that receive users of the service pay more money for their more complex receiving equipment, while the actual system operator gets by for less invested capital at the transmit end of the circuit.



Drawing from MMDS booklet by Multibroadcast Systems (1993)

TVNZ operates with 325,000 watts on channel 4 from its Auckland Waiatarua transmitter site. The coverage range is typically 100 kilometres maximum. CNNI, through PanAmSat PAS-2, operates with 36 watts of power and the distance to the Auckland receiver is more than 40,000 kilometres. A TV viewer in Auckland might install an antenna on his home with 6 dB of gain to receive the 325,000 watt signal of TV2. A CNN viewer of PAS-2 will install a dish antenna with around 40 dB of gain, and follow this with a "downconverter" with 60 dB of gain. Thus the satellite viewer is investing in 94 dB more "gain" than the TV2 viewer. And in the process, the satellite viewer is tuning in to a transmitter some 39,900 kilometres further away than the TVNZ transmitter. The burden of reception has been shifted from the transmitter operator to the receiver operator.

MDS works much in the same manner, only over distances that more approximate the TVNZ coverage distances than the satellite distance.

The Evolution of MDS

As MDS became established the "security" offered by transmitting on a special microwave frequency wavered. Today, anyone who wishes can purchase an MDS "downconverter and antenna" in the free market for around US$150. If the MDS operator derives his income by collecting money from viewers, he must control who is a viewer and who is not. If you can no longer control the distribution of MDS antennas and downconverters, you have but one option; encode the transmissions.

SKY encodes using a system developed by a Murdoch empire company; it is called Videocrypt. Virtually all encoding schemes have the same basic premise:

a) Make the video unintelligible (some also disrupt the audio as well);

b) Make each decoder box "addressable" (having its own electronic address),

c) Make it possible for a specific decoder to be "turned on" by electronic command, typically sent through the air along with the TV programming, and turned off when the owner/user of the decoder is in arrears.

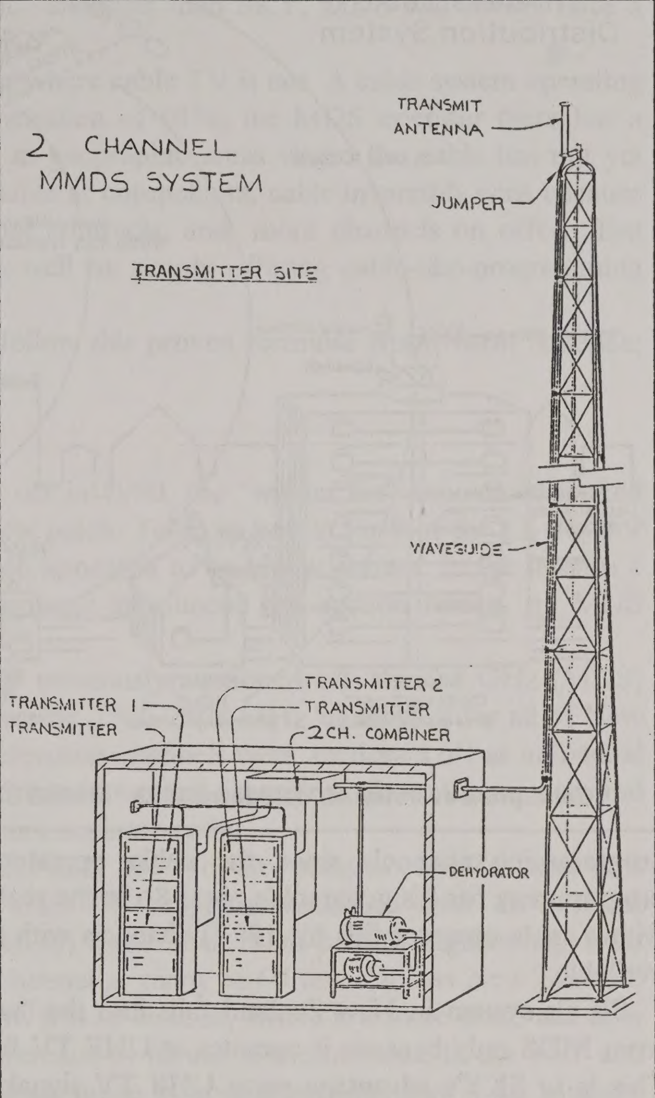
Modern encryption systems are per-channel addressable and this allows the pay TV distributor to sell "tiers" of service; the capability is there to "turn on" a decoder box for any single channel or any combination of channels being transmitted. That SKY elects to package its programming as it does is not a technical decision, it is a marketing decision.

So a modern MDS system includes a per-decoder addressable, by programme channel, security system as well. A computer with a custom software programme determines which "bits" of instruction ("Turn on," "Turn off") go to specific customer decoders.

Now the US$150 MDS antenna and downconverter becomes a US$400 (plus) package with the addition of the decoding and addressable segment. The MDS operator has two choices:

1) Depend upon local (national) law to prevent the free flow of MDS antennas and downconverters, or,

2) Encode the transmissions.

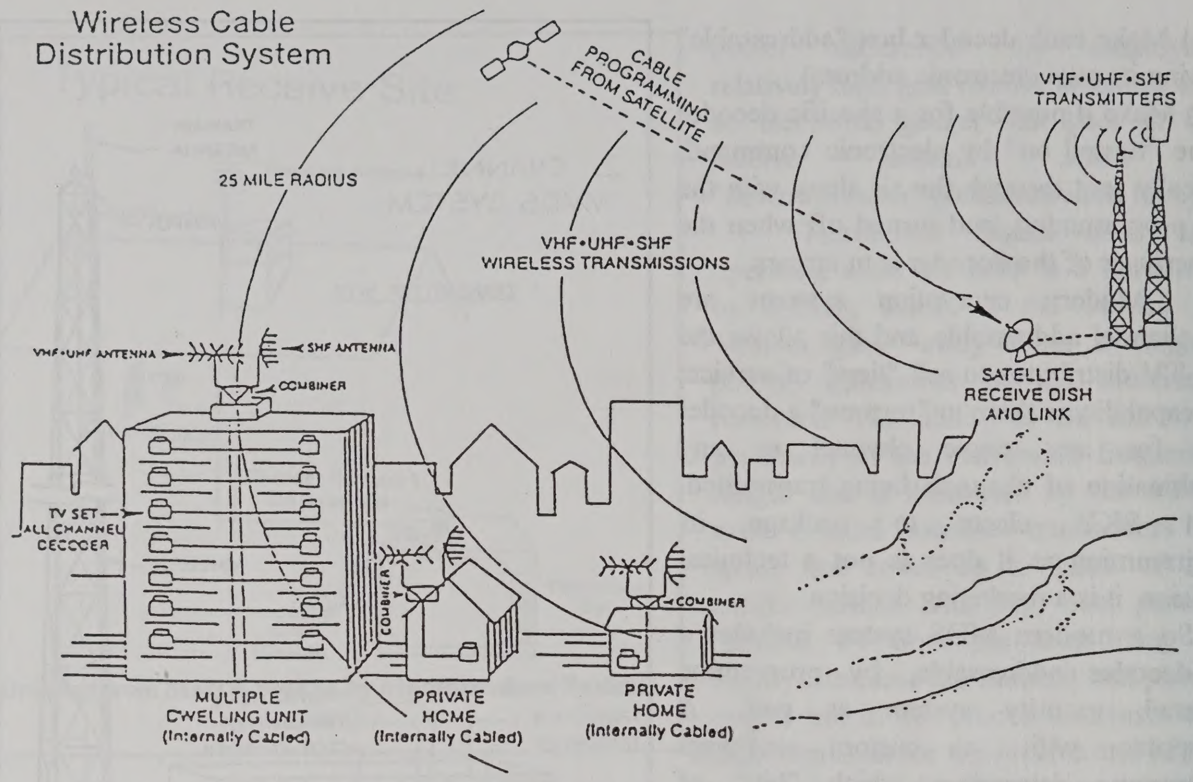


Multibroadcast Systems (1993)

SKY did not have an option, they had to encode since UHF tuning TV sets were freely available in commerce. Under New Zealand's new (1994) Copyright Act, the MDS operator also has no option; if he wishes the protection of the law, he must encode.

Wireless Cable?

MDS was originally called "wireless cable" because in its early days it was offering programming into its pay TV homes which approximated the programming also being offered via cable TV. Today in North America a 'fully loaded' cable TV system, offering to its subscribers virtually every programme channel available to the cable system, would have in excess of 400 separate TV programme channels. An MDS system seldom has more than 30 over the air transmission channels available to it and the (US) national average is 17.7 channels per system. In a totally free market, MDS carries the most popular 17 (.7) programme channels on the theory that 99% of the actual viewing takes place on these 17(.7) channels anyhow. In most areas where cable competes with MDS, the MDS operator does not have the freedom to select the 17 most popular


Wireless Cable
Distribution System
CABLE PROGRAMMING FROM SATELLITE
VHF•UHF•SHF TRANSMITTERS
25 MILE RADIUS
VHF•UHF•SHF WIRELESS TRANSMISSIONS
VHF•UHF ANTENNA
SHF ANTENNA
COMBINER
SATELLITE RECEIVE DISH AND LINK
TV SET
ALL CHANNEL DECODER
COMBINER
COMBINER
MULTIPLE DWELLING UNIT (Internally Cabled)
PRIVATE HOME (Internally Cabled)
PRIVATE HOME (Internally Cabled)

Conceptual overview of MDS from 1993 "MMDS SYSTEM" proposal by Multibroadcast Systems

programming channels since the cable operator often has an "exclusive" agreement with programmers for his geographic area. So in the real world, the MDS operator going head to head with a cable operator fills his 17(.7) channels with something less than the most popular channels available.

SKY's system in New Zealand falls into the "wireless cable" family of services. SKY differs from MDS only because it operates at UHF TV frequencies rather than microwave frequencies. This is to SKY's advantage since UHF TV signals will travel further, at lower cost, than MDS frequencies. However, the cost to SKY for their set top addressable decoder box (around NZ$250 each) is a savings versus MDS downconverter plus set top combined units of approximately NZ$150 per installation package.

MDS and SKY are virtually identical in format if not in costs and coverage. MDS costs per home-sold will average an additional NZ$150, or 60% more per household served for the home-hardware. Installation labour costs will be similar for both to 25% higher for the MDS version.

Neither system is cable TV by any stretch of the imagination. SKY is limited to a maximum of 5 simultaneous programmes with their present UHF channel arrangements, on a national basis. In a few markets, such as Auckland, they could manage another channel or two by trading with other channel holders. MDS could produce a maximum of 12 programme channels if one MDS operator was able to secure the use of all 12 MDS channels.

In the future as compressed digital video comes on line the MDS channels and the SKY channels will be in the same relative positions they enjoy today; for every new compressed programme service SKY could add with the conversion to digital, MDS could do the same. And as

MDS potentially could operate with more "basic" channels than SKY, MDS will always have a greater simultaneous programme capacity than SKY.

MDS has done best in North America by being where cable TV is not. A cable system operating in Orange County (California) has a home penetration of 61%; the MDS operator there has a penetration of 19%. But, of that 19%, 81% is in geographic areas where the cable has not yet reached. In other words, where the two are available as competitors, cable invariably wins because it typically has the better choice of programming contracts, and, more channels on offer. But where cable has not yet been built, MDS does well by simply offering cable-like-programming (i.e., "Wireless Cable").

If MDS comes to New Zealand, it may well follow this proven formulae from North America; start, first, where 'cable' TV (in this case Sky) is not.

The Frequencies

When the 12 MDS channels were auctioned off in 1990, the "winner list" announced looked very much like the same old firms playing in a new patch. Telecom was in for 8 of the 12, Sky for 1, BCL for 1. Only Multiband Television Limited appeared to be a new entrant. In the interim 4 years and 3 months since the Ministry of Commerce announced the auction results, no MDS system has surfaced in New Zealand.

Unlike the UHF television management rights previously auctioned off, the 2.3 GHz (MDS) rights are national in scope. BCL's winning bid for the 2300-2808 MHz 'channel' is for all of New Zealand, not an area or coverage region. UHF television channels were auctioned off as individual "coverage areas" and each channel was used and reused several times throughout the country and each of these different coverage areas were sold as a separate entity.

BCL, them, controls the use of 2300-2308 MHz until 2010 for any point in New Zealand. This one 'channel' is capable today of delivering one TV programme service over an area of approximately 50km radius of a well situated (MDS) transmitter. With careful engineering, BCL could itself use and reuse the 2300-2308 MHz channel as many as 60 times across New Zealand. They and they alone would make the decision how it is to be used, where it is to be used, and how its use in one area would be protected from interference by its use in another area. In the VHF and UHF TV broadcasting field, all of these decisions are made by competent engineers at the Ministry of Commerce. In MDS, the user firm does its own engineering.

Under the terms of management rights, the winning bidder can utilise their 'channel' as they see fit. There is room for one TV programme (in standard analogue format; as many as 8-10 in the futuristic compressed digital format). Or 40 fully FM stereo radio programmes. Or 2,424 telephone grade voice channels). You own (or lease) 8 MHz of spectrum you can do with as you wish; no limitations.

But, nobody has done anything; yet. And by this November, those 20 year rights will have 15 years left to run.

Early MDS Plans

Let us return to the days just prior to the management rights sale of the MDS frequencies in New Zealand.

It is May 1990 and TV3 has recently gone into receivership. The five competing firms that merged their interests to gain TV3 sanction by the then operative Broadcast Tribunal have begun to look for new ways to recapture the excitement that had been attached to TV3 when it initially went into operation.

One of those principals, Tom Parkinson, was running independent TV production house Isambard in May 1990. But his mind was elsewhere, on something called Prime Networks. Also in May 1990, Sky Networks is on the verge of kicking off its initial pay TV ":wireless cable" service. A rather unusual press release has just been circulated by a Howick solicitor on behalf of new name in the game, Prime Networks. The release relates:

1) A plan to provide a multiple-channel pay TV service in Auckland using the yet to be auctioned MDS frequencies.

2) A lifetime "membership fee" of NZ$150 with an weekly programme service fee of NZ$10;

3) Eight channels of service to include:: a) Box Office (24 hour movies), b) Festival (international and art movies, 24 hours), c) News and Sport (24 hours), d) Arts and Entertainment, e) Music Video (24 hours), f) Shopping , and g) Kidsclub (12 hours per day).

4) A November 5 (1990) start date.

If Parkinson and others in the plan were serious about this, they first had to win at least 7 (and preferably 8) of the to be tendered MDS channels. They missed their 5 November start date and in fact when the Ministry of Commerce did finally announce the winning bids on 19 November (1990) for the 12 MDS channels, the only firm that had 8 was telephone firm Telecom.

Telecom, by 1990 owned by US telephone operator Bell Atlantic, also owned a significant piece of new start-up business Sky Networks. Today, Bell Atlantic owns 12.5% of Sky. Another US telephone company, Ameritech, also owns 12.5% (1). And as Sky itself bid for and won an MDS frequency of its own, the total owned or controlled by the Telecom + Sky conglomerate became 9 of the 12 available channels.

If the remaining three channels, 2 owned by Multiband Television Limited (the only two won by the Parkinson involved group) and 1 owned by BCL, were merged into a single operation, at best they would be able to offer a 3 channel MDS service against the new Sky 3 channel service. Anyone wishing to play in the MDS patch would have to work out some sort of arrangement with Telecom since they and they alone owned sufficient MDS frequencies to create a viable, competitive-to-Sky, programming package. But, would Telecom allow a competitor to Sky to develop in as much that they owned 25% of Sky?

Several would try with names like Microband Systems Ltd. Some of the principals of Multiband TV (Isambard) actually held an option to lease the eight Telecom MDS frequencies in the Auckland area for a period late in 1992 and into 1993 under the Microband name. Alas, they did not move forward to convert their option into actual leases and on 6 August 1993 Telecom's (Dr.) Murray Milner (General Manager, Fundamental Planning, Telecom New Zealand) advised a director for Multibroadcasting Systems Ltd:

"...(unfortunately) another party has taken up options for all of the MMDS channels held under the Telecom Management Rights for the Auckland area.

"For your information, the leases for these channels involved the following basic terms

	Quantity	**Term**	**Annual Lease**
A Channels	**2**	**8 years***	**$14,340 (exclusive of GST) per channel**
B Channels	**6**	**3 years****	**$11,470 (exclusive of GST) per channel**

*** / possible extension for further 4 years**

---

1) For several years Ameritech has been considering selling its 12.5% to Bell Atlantic (Telecom) which would give Bell Atlantic 25% total of Sky. A recent story in National Business Review suggests Telecom was trying to buy up controlling interest in Sky. A highly placed source at Sky tells CTD *"This is a very unlikely scenario as TCI and Time Warner have shown no interest in selling their* (controlling) *interest in Sky to Bell Atlantic* (Telecom)*, or, anyone else."* That Telecom's new interest in MDS might be an attempt to pressure Sky is possible.

> ****/ possible extension for further 2 years."**

What Telecom had done was to take 8 absolutely identical channels and assign to them home-made differentials. Of the 8 channels, 2 became 'A Channels' with lease terms of 8 years plus a possible extension of 4 additional years while 6 became 'B Channels' with initial terms of 3 years and a possible extension of 2 more years. In actual fact, the 'A' and the 'B' channels have identical characteristics in terms of bandwidth and performance. The 8 year + 4 and the 3 year + 2 lease terms are, however, a major difference in lease-holder potential as we shall see.

The mid 1993 lease holder for the Telecom MDS channels would ultimately be disclosed to be an American MDS operator going by the name of President Communications. In September of 1994, 14 months after President secured the 8+4 and 3+2 year term leases for the Auckland area MDS channels, President would be acquired by another US MDS operator calling itself Transworld Telecommunications.

Dividing The Spoils

#56,700; 101,000; 107,900; 151,000; 211,000

Records indicate that Telecom paid in the range of NZ$75,000 for each of its 8 nation-wide MDS frequencies; NZ$560,000 total for all 8 with a twenty year term. During the lease arranged in mid 1993, Telecom will collect NZ$435,900 for 2x8 and 6x3 leases.

And this is for the 'Management Rights for the Auckland area' only. Telecom has the 'right' to create similar leases (logically for smaller annual rates) for virtually every 'market area' in New Zealand. The income which Telecom might have realised from these 8 MDS channels could easily have topped NZ$10m over the course of the twenty year rights they secured for ~~$560,000~~ 1,200,400. Of course the frequencies would be worth far more if they were actually doing something useful rather than becoming pawns in various speculative games of pay television chess as practised both within and exterior to New Zealand.

Possible Users

Only one day after Telecom's Murray Milner received a letter from Multiband (Milner's August 6 response previously cited) another plan was proposed within Multiband TV by one Rob Burgess. Burgess brought to the group considerable experience in consumer electronics rental and in an internal memo over his signature dated 24 July 1993 he wrote:

> **"For some months there have been various proposals re the broadcasting of ethnic television to the substantial minorities in the Indian and Chinese communities. To date no developments of a substantive nature have been concluded.**
>
> **"MBTV has two, twenty year licences to two nation-wide MMDS frequencies. Its' associate company has a further lease of differing** durations **directions on six Auckland only frequencies, making a total of eight."**

As Burgess and the rest of the MBTV 'gang' would learn 16 days later, they no longer had access to the 6 "*Auckland-only frequencies*." His memo continued:

> **"MBTV has studios, studio equipment, direct line of site** (sic) **to transmitting towers, experience in advertising and experience in broadcasting, programme buying, scheduling and advertising sales.**
>
> **"TV3 is on the air because of the determination of Tom Parkinson, a leading figure in MBTV. Ethnic TV will happen sooner or later. So why not now and why not with the present participants!"**

The group's loss of rights to the 6 Auckland-only frequencies by formal letter from Murray Milner on 9 August apparently put a significant damper on MBTV activities, but not the concepts that hatched within the group. They still owned two MDS channels and if these were insufficient to launch a full scale attack on Sky's service in Auckland, perhaps there were other willing users. A Chinese group that had been trying to deal for an Auckland AM or FM radio frequency was one target; would they not prefer to have a television frequency? Burgess in his July 1993 memo penned:

> **"It may advance the development (of MBTV) if we look briefly at the reasons for the current slow progress:**

"1) A general lack of trust between the parties
"2) No common playing field - We have all been talking to different parties with their own agendas.
"3) A lack of development (sic) funds."

That Chinese and Indian groups interest in ethnic broadcasting was real in 1993 seems non-contested by the participants. That any of these groups had even a clue where to go for the required television programming, how to get that programming into New Zealand once they found it, and then how to distribute (i.e., broadcast) it once here is also not contested. Two employees of Tisco (an Auckland based TV and electronics service company), Bob Ahrens and Tony Dunnett, tried to put all of these elements together during 1993 and produced a booklet which saw limited distribution within the Auckland investment community. By late in 1993, the interest in using the MDS allocations had once again ebbed.

It was sometime during this period that an unexplained one-off incident occurred within the MDS frequency range. Recall that BCL won management rights for a single channel (2300-2308 MHz). Also understand that BCL routinely supplies transmission equipment, transmission equipment installation engineering, and leases out transmission sites to virtually anyone willing to pay their tariffs. BCL, as the engineering arm of TVNZ, has never been known as a "speculator in equipment installation." For their own use BCL may quietly order in equipment, install it and make it ready for operation. For an outside firm, BCL, has never been known to order in equipment in advance of having an actual order, signed contract and at least a sizeable deposit, in hand.

It is a mystery, then, why BCL might have installed an 8 channel MDS transmitter system at their Waiatarua transmission site in Auckland during this approximate period. Yet that is exactly what appears to have happened. Reports that BCL has had for approximately 18 months an eight transmitter 'bay' of equipment at Waiatarua using 50 watt output Comwave (brand) transmitters persist. CTD asked Chris Lambourne at BCL in Auckland to deny such an installation was in place. Lambourne:

"BCL presently has no operating MDS transmitters at Waiatarua."

CTD, again:

"Do you deny that an 8 transmitter complex was installed at Waiatarua and that it is in place today?"

Lambourne:

"I repeat, BCL presently has no operating MDS transmitters at Waiatarua."

Defining The Telecom Policy

Through the period November 1990 to November 1995 the "real" plan at Telecom for its 8 MDS frequencies was never disclosed. A number of Telecom strategists, including (Dr.) Murray Milner, believed the frequencies to be more than an investment to be leased for varying periods of time to others. Telecom was toying with being a participant in the wired cable TV business and their 1993 trial test of a 600 home region in Pakuranga and New Lynn was not done in isolation from their MDS frequency asset pool. Milner would admit this to one John Lynam of HB Cable & Satellite TV as recently as the 3rd of February this year. Milner told Lynam:

"Telecom purchased the MDS rights with the intention of using this medium to roll out cable TV service."

(2)

Lynam was interested in securing lease agreements for wireless cable frequencies for areas outside of Auckland proper and having identified population centres now without Sky service, was focusing on markets with typically 50,000 and down residents. He was told by Milner:

"We are now looking at new plans for regional areas, having already formulated a plan for the densely populated regions. This plan should be another 3 months in the work up stage and until we have the plans complete, I cannot talk with you concerning leases of our MDS frequencies."

Milner also admits Telecom has "ongoing discussion" underway with "the new lease-holders of the Auckland area Telecom owned MDS channels."

Enter Transworld Telecommunications

This Salt Lake City (Utah) firm operates wireless cable in more than a dozen markets in North America. They have a significant, ongoing business relationship with key programmers in the cable TV service family and like the Sky ownership pool can go directly to the 'top' of programmers such as Showtime, The Health Channel and dozens of others.

Transworld acquired the now ageing original Telecom leases to President Communications by purchasing the assets of President this past September. Transworld's Paul Gadzinski told CTD:

"The Auckland MDS frequencies under lease (by President) were known to us, they certainly were not a surprise that jumped out at inventory time. But I can assure you we assigned very little asset value to the leases when acquiring the company."

Gadzinski made his first inspection trip to Auckland during late-January and he wanted to visit with anyone who could help him better understand the revenue potential of this asset.

"The short term nature of the leases is a liability. It has been our experience that in a new build situation we should plan on an initial five year term to get the system in and established. Our cash flow projections in a new market seldom turn positive before the end of the third year and for the next two years we are making up for loses incurred in the first three. For that reason we would be foolish to consider any business plan that involved rights to frequencies for a term of less than ten years. After all is said and done, Transworld is a bottom line oriented company and we have to see that we can be in this long enough to make a reasonable profit or we won't get started at all."

If Milner's data is accurate, the Auckland Telecom leases at this point look like this:

A Channels (two total): 8 year leases began July 1993, terminate July 2001
with possible extension to 2005

B Channels (six total): 3 year leases began July 1993, terminate July 1996
with possible extension to July 1998

Telecom's A/B channel ploy effectively eliminates the possibility that Transworld might go ahead with an MDS service plan for Auckland. Even if the contractual right to renew the B channel group lease through 1998 is under the control of Transworld, as Gadzinski points out, "*We would be foolish to consider any business plan that involved rights to frequencies for a term of less than ten years*"; 2005.

Gadzinski believes that for an MDS service to be viable in New Zealand, the system must offer subscribers at least ten channels of pay television. He is sanguine concerning how successful Transworld might be in obtaining programme use rights for any of the programme services now under contract to Sky or others in New Zealand.

"CNN and ESPN are important basic services for any wireless cable system. But they are not absolutely essential. We deal with both programmers in our North American operations and that would at least give us a foot in the door in talking about possible rights for MDS in New Zealand."

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2)/ There is an amusing, perhaps true, anecdotal story of just how Telecom actually viewed their MDS frequencies in the 1990-1993 era, contrary to their present statements that MDS were always considered to be a "*hedge on rolling out cable TV in New Zealand.*"

At a Board of Director's meeting of Sky Network, the Bell Atlantic representative was called on the carpet for allowing Telecom MDS channels to be leased out to potential Sky competitors. He related:

"*Within Telecom there is a department that disposes of surplus property; old trucks and that sort of thing. Somehow these frequencies ended up in the hands of this department and they arranged the lease to the US MDS firm.*" That Telecom had very little interest in the MDS channels in 1993 is evident, regardless of how the channels were disposed of by lease at that time.

In the United States, programming access controlled by cable TV interests has been a paramount issue for wireless cable operators. Wireless was initially denied access to services which local cable was using, a situation that drew the attention of the US Congress with legislation designed to force cable programmers to share their programming outside of the wired-cable family. None of the new rules that apply in the United States apply in New Zealand and as Kiwi Cable learned this past November (CTD: 9411, p.2), New Zealand law cannot be used to force a programmer such as ESPN to share its programming with a multitude of customers. Sky's contracts with CNN and ESPN might eliminate these two services from wireless cable use here for quite some time.

Gadzinski considers programming to be a serious concern and in January his list of possible programme sources for a wireless cable service here was both tentative and it also fell short of the ten number he himself stated was essential for commercial success against Sky. While here he held discussions with JDA who was offering him use rights for the new Auckland 'Casino Tower' site, and BCL which was pushing their Waiatarua site. Gadzinski was concerned that any single site in Auckland would leave sizeable "shadow regions" inside of which there would be limited (or no) coverage. It was with some surprise that an announcement appeared in the Auckland Herald the 26th of January advising that BCL was planning to install an 8 channel MDS transmitter at the Pine Hill (Browns Bay) relay site.

CTD queried BCL's Lambourne: concerning this Pine Hill notice:

> **"We are merely moving to have the permit completed in anticipation of a (new) demand for MDS services from that transmission site."**

Lambourne, who indirectly had admitted that existence of a functional 8 transmitter MDS equipment package at the Waiatarua site, could not explain to CTD why BCL, which itself owns management rights to only a single MDS channel, would be making Resource Management Act application for 8 transmission channels at the Pine Hill site **(3)**.

The answer may surprise you.

The Position of Telecom

That Telecom has an interest in developing a wide bandwidth to-the-home distribution system is well known. And, that their inventory of eight nation-wide MDS channels might fit into that plan is also oft expressed by Milner and others.

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3) BCL's Notice under the Environmental Act, on public file at the North Shore Council offices, says a 2.4m x .2m radiating antenna would be placed at a height of 28m above ground at the top of the existing 'mast'. BCL's application relates 8 MDS channels. A supporting document prepared by Dr. Andrew McEwan (Director, National Radiation Laboratory, Ministry of Health, Christchurch) speaks of 12 MDS transmission channels each with an ERP (effective radiated power) of 170 watts per channel. McEwan's statement analyses the environmental impact of 12 MDS transmitters each with a peak ERP of 170 watts and comes to the conclusion that "*transmissions from the station ... will have no adverse effect on the health of any resident in the vicinity.*" BCL also stated "*radiation exposure levels from the station would be many times lower than the acceptable level of leakage from a domestic microwave oven.*"

The radiation hazard from MDS transmitters has been a bothersome element in the growth of MDS in other countries. In Ireland, for example, residents living near proposed MDS transmitter sites have been able to successfully deny local approval for the transmitters out of a fear that human tissue heating from MDS transmitters might be harmful. In fact, domestic microwave ovens do operate at approximately the same average power levels as a 100 watt MDS transmitter and in almost precisely the same frequency range. This coincidence has not gone unnoticed by Irish opponents to MDS and in many sections of that country billboard signs urging "Ban MDS Transmitters" are as prominently displayed as "Ban 1080" signs in New Zealand.

Dr. Mansoor Shafi works under Milner in the Fundamental Studies department at Telecom, Wellington. Shafi explained to CTD,

> **"We are currently studying how MDS might fit into our 'entertainment business' applications. We are considering a combination of fibre optics and coaxial cable for the densely populated regions, and perhaps MDS will be used to fill in areas not easily reached by** (fibre optic) **trunk cables or areas under dense in population. MDS is not our only alternate method of delivery; we are also looking very closely at satellite delivery as well."**

Dr. Shafi went on to explain how an "*ideal MDS transmission site, such as the new Sky (Casino) Tower*" in downtown Auckland, could reach a greater number of people than any single existing transmission site (operated by BCL). He acknowledged "*We are talking with JDA about this site at this time.*"

The densely populated regions would be served by a hybrid network of fibre (trunking) and coaxial cable. He suggests fibre would go into a (cell) sub-distribution point and then coaxial cable would take over for the actual interconnection to "*between 400 and 600 homes*" per site.

He also suggests "*MDS may also be used as an early roll out system for cable,*" allowing Telecom to get into the cable business quickly from a location such as the Casino Tower. With essentially full-Auckland region coverage, Telecom could offer a competitive to Sky service virtually overnight and then go about its business of the five to ten year construction required for hardwire fibre plus coaxial cable installation.

Under these circumstances Telecom has no interest in extending its existing leases with Transworld Telecommunications and Dr. Shafi did not deny that gaining back 6 of the 8 Transworld frequencies by mid 1996 was a new concept to his planning. But competing with Sky may not be their real plan here.

Sky's Need to Tie Up Programming Rights

When Sky began service to New Zealand in mid 1990, it was not only the first wireless pay TV system in the South Pacific, it was also the first venture into the south Pacific by North American cable TV operators (portions of SKY are owned by several cable TV firms in the US plus two major regional Bell telephone companies). Within the corporate structure of Sky ownership are several very important leverage tools that can be applied to the control of new programming for New Zealand. By denying programming to firms such as Transworld, Sky is better able to fend off competition.

But the cable TV programming universe is growing daily and many new firms without corporate ties to Sky's corporate hierarchy have evolved. In other words, programming sources that could be 'controlled' in 1990 have now grown into a much larger programming universe that is not so easily controlled by corporate leverage, in 1995.

Sooner or later, to keep competition with new programming sources out of New Zealand, Sky has to actually sign up for and use these new programming sources. It can delay the appearance of some services through board room manipulation; others will come to New Zealand through paths alternate to Sky unless Sky is willing and able to actually use the new programming .

This is the situation Sky finds itself facing today. Their present five channel service using UHF frequencies has for all practical purposes exhausted the available UHF TV channels. Yet Sky requires additional frequencies to offer new programming sources now threatening to come here via any other means available.

Sky, then, becomes a leading candidate for expansion into MDS frequencies in at least the Auckland market and by doing so they are able to negotiate "exclusive use agreements" with perhaps as many as 12 of the new programming sources coming on line for the Pacific. Sometimes the best defence against competition is to simply tie up the competitor's product lines.

For ten of the 12 MDS frequencies there is a certain 'cosiness' that is capable of boosting Sky's continued domination of the pay television industry here.

a) 001JJA (2300-2308 MHz) owned by BCL. BCL is of course owned by TVNZ, which in turn owns just under 17% of Sky. Score one channel for Sky use.

b) 005JJE (2332-2340 MHz) owned by Sky Telecommunications Limited; score two for Sky.

c) 001JJB (2308-2316), 003JJC (2316-2324), 004JJD (2324-2332), 010JAJ (2372-2380), 011JAA (2380-2388) and 012JAB (2388-2396) owned by Telecom and on a short term lease running out in July 1996. Telecom is owned by Bell Atlantic which owns 12.5% (and is said to be dealing for 12.5% more) of Sky so score numbers 3 to 8 for Sky.

That leaves two additional longer lease term Telecom channels (006JJF, 2340-2348 and 008JJH 2356-2364 MHz) to run through 2001. And, the two original Microband channels held by the Parkinson group (007JJG, 2348-2356 and 009JJI, 2364-2372 MHz) **(4)**. Without any of these four, Sky could be operational with 8 new MDS channels by the middle of 1996 in Auckland.

Alternately, Telecom itself could be active with six of its own frequencies by mid 1996 and if it 'dealed' for the two Microband channels, 8 by mid-1996. So what is actually happening here?

Meanwhile - Outside of Auckland

But what about other market areas in New Zealand? Has Telecom or any of the other MDS rights holders put their frequencies to use elsewhere?

BCL claims to have installed and tested a single channel MDS transmitter in the Wellington area. Chris Lambourne says,

> **"This was a test and the transmitter is no longer active."**

Following the Satellite and Cable Seminar (Hawkes Bay, September 1994) sponsored by CTD, and twin presentations dealing with the technical aspects of MDS by Glyn Bostick from US firm Communications & ~~Power~~ Electronics, a number of seminar attendees have continued their study of the MDS possibilities. Those who have contacted Telecom's Milner have been uniformly told,

> **"We are now studying possible uses for MDS in regional** (less densely populated) **areas. We should have a clearer idea by the middle of May as to what areas, if any, will be released for lease to others."**

A number of regions continue to be 'bothersome' to Sky; areas where Sky is not available, where the costs of stretching Sky using traditional terrestrial (microwave linked) systems is prohibitive. CTD's interview with Sky's John Fellett (9409; p.2) identified several such regions. They would include, on the short list, at least New Plymouth, Whangarei, Gisborne, Nelson, and Timaru. There are 26 other 'regions' with between 2,500 and 4,500 potential homes; all too small to support an expensive five channel UHF relay system for Sky's service but perhaps large enough to support a lower cost MDS system approach.

THUS?

Who's on first? We believe it is Telecom; that Telecom contacts with equipment and service suppliers (a subject we have not touched, here, out of respect to commercial sensitivities) are real. If this is accurate, Sky's hold on pay TV in New Zealand could be under threat by mid-1996.

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4)/ CTD understands that at one time Sky stockholder TCI held at least an option on one of the Multiband Television MDS channels during a period when Sky was exploring possible use of MDS itself in lieu of its recent expansion through TAB leading to the 5 channel Sky UHF package. Sky studies of co-installing UHF aerials along with MDS aerials and block downconverters at each customer's home suggested that splitting the service on UHF and MDS was not a viable option and would require considerable expertise not available within the aerial installing industry. Sky needs new channels; MDS, they say, is not a viable option.

TECHNOLOGY BYTES

...BITS and BYTES you may have missed in the rush to make a buck ...

February 23, 1995 / ISSUE 95-2-15

SATELLITE TV AND RADIO

ApStar 2 loss late in January, during launch at China's Xichang space centre, has created flurry of cable /SMATV /DTH programmer activity. ApStar 2 had never announced intended in-orbit position and following last August's launch of ApStar 1 to controversial 131E (they later moved to 138E) this failure to identify a location further fuelled speculation about its location. For now, that is forgotten as cable programmers HBO, ESPN, Turner and others scramble to find a replacement satellite to serve India and the continent of Asia. Programmer ANBC (now on PAS-2) and Hong Kong's TVB are talking with Indonesia for space on their C-1 satellite scheduled for Ariane launch in October to 113E. Both had space reserved on APT2. C1 has special coverage beam designed by Hughes which will reach significant portions of the Pacific including New Zealand and Australia at signal levels high enough to support home reception with dishes in 2 to 3m range. ApStar 2 loss was fourth for Chinese since 1992.

AsiaSat 2, scheduled for Chinese Long March launch from Xichang, will not confirm it would like to get out from under Chinese launch contract but industry sources say AsiaSat is "very nervous about using the Long March after ApStar launch disaster." AsiaSat 2 at 100.5E will provide strong signal level coverage to New Zealand and Australia but will suffer from low look angle (earth) noise for all New Zealand locations. Sources within AsiaSat customer Star Net do confirm they now do not expect their new service to be available "before the month of September" suggesting that the launch itself is now rescheduled to mid-July at the earliest. Originally the launch was scheduled for April-May with Star Net service to begin in July.

Star Net is ready to turn on a "preview channel service" using Palapa B2P satellite (113E) transponder 12V as soon as authorities approve their application for uplinking from Hong Kong. Star Net is taking programming from a variety of its free to air AsiaSat 1 services (BBC World, Prime Sports, Star Plus, Channel V) to programme in free to air format for approximately 14 hours each day. For the balance of the day, their Videocrypt encoded movie service will be transmitted. Indonesia and Northern Australia are seen as "important service areas" for Star Net once it begins service from AsiaSat 2 and by making the service available on Palapa on an interim basis pending launch of AsiaSat 2 they will be doing "advance marketing" of their services. In Australia, Pace (brand) receiver distributors have been urged to stock up on the appropriate analogue equipment to service Australian viewers of the new Palapa B2P service. Australian regulations prevent the use of non-Australian fee-paid services (such as the encrypted movies) but allow viewers to use unencrypted services.

Murdoch's (US) **Fox Television Network** has signed an agreement with (British headquartered) Reuters to provide a trio of television newscasts each day. Murdoch's Star Net Asian television service presently carries BBC World Service as a news and information channel. Murdoch's Sky Broadcasting reported its pre-tax profit grew to NZ$136.19m, up 46% from the same quarter in 1993. BSkyB has been traded on New York and London exchanges since 8 December opening at NZ$6.27 but now projected to settle in near NZ$4.90 short term.

RAJ-TV, the powerhouse Tamil language service on Rimsat from 130E (easily received in New Zealand on dishes down to 2m size), plans an expansion from their present 7 hour telecast day to 18 hours 14 April. The service creates its own programming from a newly completed studio in Madras (India), ships videotapes with the programmes to Manila daily for uplinking. The advertising supported service is targeted at viewers in the south-east of India, Sri

SatFACTS MONTHLY IS NOW A MAGAZINE

Our SatFACTS Newsletter, begun last September, became a full format magazine with news-stand distribution February 15th. Subscription growth and the rapid expansion of business and private interest in DTH, SMATV and cable television systems necessitated the expansion. SatFACTS now has subscribers in 22 countries and will be joined on New Zealand and Australian news-stands by SatFACTS Quarterly in the last half of 1995.

Lanka and throughout Asia. The station owner, appropriately 'Mr. Raj', is inviting queries from programmers wishing to reach viewers in his significant coverage region at (FAX) 91-44-868195. The coverage of this particular Rimsat transponder is quite awesome, fully 1/3rd of the earth's surface taking in virtually all of India and the Middle East, all of the Pacific and even reaching to the western coast of North America, with signal levels so strong that dishes as small as 0.5m are adequate for many locations, no larger than 3m at any location within view of the satellite.

Central China Television (CCTV) has joined Hong Kong's Chinese Television Network (CTN) on PanAmSat transponder 2H to distribute 24 hour feed of Mandarin language television to North America and Europe. CCTV is using the same Hong Kong uplink system as CTN and is in Scientific Atlanta MPEG 2 digital format, simplifying the receiver stocking for any users of Mandarin language programming. CTN has selected a programme distributor representative for the Pacific Ocean region (see SatFACTS 15 March 1995) and CCTV is expected to follow suit. Both CTN and CCTV services are expected to attract considerable Chinese immigrant interest in both Australia and New Zealand. Home dish sizes of around 2.4m are adequate for New Zealand, as small as 1.8m for most of Australia's eastern areas. Our SatFACTS for February 15th reports the Scientific Atlanta model D9222 IRD (integrated receiver decoder) required for this service has a net-to-distributor price of around US$1,445 in New Zealand, freight inclusive (plus GST). A typical New Zealand 2.4m system should wholesale to DTH installers in the region of NZ$4,405 suggesting street prices of around NZ$6,727 including installation. Monthly programming fees are in the region of US$15 per Mandarin language channel per month.

National Technology University advanced education and distant learning project (CTD: 9501, p.12) is now being used by Waikato University as well as University of Auckland. The service is 24 hours per day, is transmitted throughout Pacific using PAS-2 (TR3V) with unique Compression Labs Inc. (CLI) SpectrumSaver 3.3 M/bps compressed digital video. Although the service is formally "in test" for the next month or more, sources tell CTD the response from Pacific area educational institutions and corporations has been significant and they believe tests will evolve into permanent service. The service is represented in Australia and New Zealand by Learning Network Pty :Ltd (7 Martin St., South Melbourne, Victoria 3206; Tel. 61-3-699-7144; Fax 61-3-699-4947) and the special format SpectrumSaver receiver is being leased, or sold outright for A$3,950 including an LNB. Headquarters for the service is NTU, 700 Center Avenue, Ft. Collins, Co. 80526-1842 (Tel. 303-495-6400, Fax 303-484-0668).

PanAmSat PAS-2 Programmer Update

Country Music Television (CMT) programming continues as "test source" on Ku transponder 6K (vertical) in NTSC format. Tests in New Zealand with dishes down to 60cm diameter are producing noise-free pictures, significantly better than PanAmSat predicted coverage. On C band **Prime Sports** has terminated analogue transmissions, is now on TR9V with pair of (US originated) **Encore** feature movie programme channels in Scientific Atlanta MPEG 2 format being fed to Australis/Galaxy pay TV network facility. Prime Sports advises they hope to have DTH / SMATV/ CATV sports channel available for Pacific use by mid 1995, also in digital. **ANBC / CNBC** (business and financial channel) will split into pair of programme services in May and switch from free to air analogue to new Philips developed compressed digital video package. "Superchannel Asia" and "ANBC Financial" will be available to Pacific region cable TV systems at around US$1 per month for the pair, $.30 for only financial service. Both will be 24 hours. **CNNI** continues in free to air analogue, has decided it may not group MCPC transmissions with analogue format after all. CNN had announced selection of analogue Leitch encryption system and was proposing 1 March switch-on date. Tests of Leitch system have been seen on both Intelsat 180 and PAS-2 around 12 midnight NZT. However, after loss of ApStar 2 satellite, thinking at Turner is that Leitch decision could be wrong one and CNNI may not use it . Leitch decoder availability remains unknown as earlier 1 March deadline rushes forward. In New Zealand, Sky Network had claimed they were to be exclusive representative for CNNI, ESPN and Discovery in this country. That, also, seems to be subject to change with Discovery suggesting to Sky that they, themselves, will now handle DTH authorisations in New Zealand. Several early buyers of Scientific Atlanta 9708-PAL B-MAC decoders for Discovery have as of our press time been unable to get them authorised through Sky. ESPN is also questioning Sky closely about its pre-1995 distribution of B-MAC decoders within New Zealand; Sky claims only one such unit has ever been authorised here. Others, known to exist, have an "unknown origin" and that is of concern to ESPN officials. **Chinese Television Network** has reached agreement with a programme distributor for New Zealand and the first S/A D9222 cable-grade decoders for CTN and CMT are in shipment to New Zealand from S/A Canada. **Central China Television (CCTV)** is latest programmer, using S/A MCPC, to appear on PAS-2.

University of Auckland will hold formal dedication ceremony for its 7.3m satellite dish learning tool system at 2PM Friday 10 March at the Tamaki Campus site. Minister of Communications Maurice Williamson, other dignitaries, are expected to participate.

British High Court has granted a permanent injunction against very public sales of so-called Pirate BSkyB authorisation cards by one David Lyons. Lyons had previously won a similar court case heard in Irish court.

PanAmSat PAS-4, for the Indian Ocean region, has a scheduled launch date of July. The satellite will complete the globe-circling capability of the network and a number of PAS-2 users, including Country Music Television and Turner, have indicated they will be available on PAS-4.

ESPN is to be represented in Australia by Optus. Competitor Australis / Galaxy is already offering a competitive satellite delivered sports service (Prime Sports; see "Terrestrial" in following pages). No pricing has been announced.

The World Of Satellite TV, popular Mark Long book widely distributed in Australia and New Zealand, 1995 edition has been delayed. The last revision of the book was in 1992 although a Thai language edition was published (with updates) in 1993. Peter C. Lacey Services Pty. Ltd. will be the printer and publisher of the new edition when it is available "after mid 1995." The new edition will contain advertising from Pacific area equipment suppliers for the first time, will continue to be distributed by Dick Smith Electronics and others. Lacey reports more than 5,000 copies sold in the Pacific in the past two years. Creator Long recently moved his operations from Florida to Bangkok after selling his interests in several other annual publications to an American publishing house.

Optus Communications had a 1994 end of year operating loss of NZ$120m making a total loss for 1993-1994 of NZ$212m.

PAS-2 will be carrying MCPC tests on Ku band on their China and Northeast Asia beams by 1 March. Several firms headquartered in Taiwan have shown an interest in reaching into China (proper) with television programming and at boresight PAS-2 Ku beam into region will allow antennas under 0.5m to be utilised for reception.

(US) FCC has made initial frequency allocation for satellite delivered digital audio radio service (DARS); 2310-2360 MHz band. During 1992 WARC (World Administrative Radio Conference) delegates had voted to set aside 2335-2360 MHz for DARS. In New Zealand, this frequency band is allocated to MDS/MMDS services although no transmitters presently operate in this region. In most areas of the world, all or substantial portions of this band are reserved for "ham radio' use. The frequency band would require a new design of satellites (none have used this frequency region previously) and a new family of digital audio receivers that also do not presently exist. 'CD quality" multiple channels of audio entertainment and information are proposed by several firms that have been lobbying in Washington for permission to build satellites and operate. The most optimistic forecast for operation is 1998. The satellites will be designed to provide direct reception to 'tiny antennas' mounted on vehicles, on the inside of south-facing (in North America) glass windows or directly on the miniature portable radios themselves for outdoor use.

NBC network, currently providing Asian service feed 24 hours per day on PAS-2, says it is building a news organisation to compete with CNN "within five years." The network launched NBC Superchannel in Europe during 1994 to go with its CNBC (financial news) service; will do same into Pacific in May with two separate 24 hour programming channels carried on PAS-2. Superchannel (Asia), like the European counterpart, will use established NBC news and feature programmes (Today, NBC Nightly News, Tonight with Jay Leno) as "anchors" and add "magazine programmes and special NBC news produced features" to complete each day. All news channel within five years would be additional service.

Sony will join Thomson Consumer Electronics as a supplier for the vastly popular Digital Satellite System (DSS) hardware in the US in May. Sony had been selected to be number two source for the hardware with the understanding that Thomson would sell the first 1,000,000 units before Sony entered the field. DSS brings 175 changes of digital TV with multiple audio channels and widescreen (16:9) advantages to homes throughout North America on dishes 0.5m in size. The system was launched in June 1994. Marketing forecasts are suggesting that Sony and Thomson will be able to stand competition from a third and fourth supply source as soon as mid 1996 and two Japanese firms, Panasonic and Uniden, are reported to be on the short-list. DSS will have an additional 30 channels of digital video programming available by October following launch of the third Hughes satellite to the present two-satellite constellation. Generation 2 Thomson DSS decoders feature single chip channel decoder by LSI.

DSS competitor Primestar, largely owned by consortium of major cable television system operators, reports it has passed 250,000 subscriber mark. Primestar offers 73 digital channels, will grow to 200 with launch of new high powered satellite in 1996. Present DTH dishes are 1m in size and to date virtually all selling has been through cable company offices throughout North America. System uses GI IRDs and Digicipher I technology but will change out to Digicipher II starting in fourth quarter this year. To combat the competition from Thomson-Hughes DSS service, Primestar cable owners have announced a US$120m advertising budget during balance of 1995.

European SES has ordered Hughes 601 satellite for Astra 1G operation. Satellite will have 28 Ku band transponders and 100 watts of power per transponder.

Canadian version of direct to home (DTH) satellite delivery is set to launch 1 September using full MPEG 2 format standard. TV/Com International and Espressvu are partners in system that will use ANIK satellite for Ku band delivery.

TCI's Liberty International, operator of Prime TV service on PAS-2 with sporting event feeds to Australis pay television service, has proposed that corporate stock be traded separately from TCI stock. Liberty has world-wide investments in cable TV programming and systems and is one of the major corporate units of parent TCI.

DIGITAL TV AND RADIO

MPEG 2 solution, a world standard for all compressed digital video, may not be a standard after all. General Instrument has advised our SatFACTS Monthly "*The Digicipher II MPEG-2 based product (*available after mid year*) will not be compatible with other MPEG 2 products. A transmission system user of Digicipher II will require a Digicipher receiver; those of Scientific Atlanta, for example, will not decode Digicipher transmissions.*" And conversely, S/A MPEG 2 format transmissions will not be decoded by GI receivers. However, this hiccup may only be a temporary incompatibility problem as SGS-Thomson Microelectronics, Inc. has announced a dual-mode video decoder chip development programme in concert with GI. The new dual-mode chip will allow the design of receivers capable of receiving and converting either format thereby reducing costs for users and improving the flexibility of DTH, SMATV and cable TV digital receivers.

MPEG 2 decoder chips, while now available in some quantity, are going through a new shake down period as receiver manufacturers have discovered chips coming from different manufacturers are not interchangeable on circuit boards. The non compatibility between chips is thought to be due to minute architectural differences employed by chip designers although each designer believed he was starting with the same MPEG 2 standard foundation. This discovery that "*MPEG 2 chips from different suppliers do not respond in the same way to identical input signals*" is throttling back original estimates of wide scale availability of chips for receiver manufacturers and the latest forecast for "*when chips will be available in real quantities*" is now moved to the "*first quarter of 1996.*" As a practical matter, satellite receivers requiring MPEG 2 chips, cable converters and consumer products including digital video VCRs and camcorders will be delayed well into the 1996 year.

Digital audio broadcasting in band III in UK will begin in September in London region with stereo service for Radio 1 to 4 plus monaural service for Radio 5. Special radio service channels in DAB for sporting coverage and extended coverage of Parliament will also be included. The UK VHF DAB transmission system will be the first in the world to introduce the new format radio to the public.

Oracle, the third largest software firm on the planet, is testing their Stream Server software programme in a British Telecom interactive trials at Martlesham (Ipswich and Colchester). The trials should settle whether Oracle has hit upon a software solution to compressing video imagery sufficient that full television programming can be sent over copper telephone lines up to several kilometres in length. Oracle's software is compatible with massively parallel processing computers and if the bandwidth crunching works, BT will be able to maintain on file only a single copy of any programme material with each successive user having independent access to the programme simultaneously. BT says the results of the trials are very important for they will determine whether the company proceeds with a national roll out of fibre optic cable or uses the Oracle approach to compress the imagery over existing copper lines.

Advisory committee to (US) FCC has submitted computer modelling programme to allow assignment of new HDTV (digital) TV transmitters across USA. Original concept was to utilise only UHF channels for HDTV but field tests of American HDTV system has proven the system can coexist with NTSC analogue transmitters without causing interference or being interfered with if very specific engineering criteria are followed. Both VHF and UHF channels are in national allocations table modelled for FCC and by using latest topographical (terrain) profiles available as computer software the allocations table takes into account terrain variations and shielding. Previous allocation work had always assumed a "smooth earth" without terrain obstructions because taking terrain variations into consideration was too labour intensive to justify. FCC is considering setting end-of-analogue transmission date of 2011 assuming the first year of serious HDTV availability in US will be 1996.

French electronics firm DiviCom has signed a contract with Bell Atlantic (parent of NZ Telecom) for French developed MPEG 2 encoding equipment. The DiviCom system works with sufficient 'speed' to allow real time conversion of live (sporting) events to MPEG 2 while technology previously available to BA was MPEG 1 based and was only suitable for filmed material conversion to digital video. BA will use the system for their new hybrid fibre/coax distribution network in Virginia and New Jersey.

Digital Videodisc (DVD) has turned into claims and counterclaims exchanged between trio of primary system developers leading to perhaps temporary state of mass confusion as to which, if any, of the systems now being demonstrated will ultimately turn out to be the 'standard' for industry. Earlier problems of finding ways of getting full length movies on single sided 5" disc are now past but each system developer has own unique solution. Sony-Philips (SP) group claims competitor Warner Home Video's (WHV) system cannot be duplicated in mass production environment and says disc reliability will be poor. WHV in response claims their system has been carefully tested by major movie firms and they are behind the WHV concept. Sony says more than 30 movies have been tested to date and a wide ranging group of engineers and users have all given their system top marks. Each side admits that varying lightning sequences, abrupt changes in on-screen action are serious tests for the DVD encoder systems to accurately transfer the images to compressed digital data on the discs. The standard each is touting is the so-called 'D-1 image standard' which refers to a broadcast quality videotape standard accepted by most broadcast engineers as suitable for both video production and multiple-editing tasks. After several weeks of intense exchanges, Japan's Matsushita and Thomson Consumer Electronics came out with endorsement of Toshiba-Time Warner format. They were then joined by Mitsubishi and JVC. With the possibility the format battle is now past, a Time Warner spokesman was forecasting when the first product would reach consumer hands. Most agree that the third or fourth quarter of 1996 is realistic for players that will retail to consumers for US$500/NZ$825 while the Hollywood studios supporting the project seem to have agreed they will support the launch with at least 250 movie titles with a consumer retail near NZ$49.50 each. Video stores will be able to rent DVDs as they now rent VHS movie tapes, but at the $49.50 price studios are expecting that a large percentage of the discs will "sell through" rather than rent. Of interest, Sony's Beta format consumer videotape died during competition with VHS; now Sony's DVD format has been pushed aside in favour of a rival Toshiba based system. See box summary page 20 here.

Japanese have finally moved forward with programme to bring their consumer television industry into the digital video world. Five TV networks, five major TV manufacturers and Japanese Ministry of Posts and Communications have formed US$23m corporation to develop CDV strategies and hardware that will lead to both digital satellite and digital terrestrial TV broadcasting.

CONSUMER ELECTRONICS

Samsung will begin shipping "world standard VCR" by the end of June. Priced at NZ$3,300, the VCR will produce any selected output (analogue) format video with any selected input and will be suitable for standards conversion for satellite video as well as other applications.

Advice To Telephone Companies

John Edwards of PA Consulting Group, Sydney has given recommendations to gathering of telephone operators at Pacific Telecommunications Council meeting in Honolulu. He told group:

"Very few telcos have forged commercially successful alliances and now risk losing their franchises as new technologies propel entrepreneurial companies into the telephone communications field.

"Recent developments in the telephone industry resemble issues which were confronting the computer firms just 15 years ago. At that time, mainframe manufacturers lost market share to PC makers who outmarketed companies more intent upon manufacturing hardware than on developing customer services and user applications.

"The opportunity now before the telephone companies will be a very brief window in time; if telcos do not make great efforts to exploit the advantage of complete customer base access, the new competition will outflank them. Many telephone firms seem to be rushing into alliances with high profile media and technology companies with no clear purpose for the alliances. The telephone company ought to be developing its role as a service integrator and co-ordinating the work of software packagers, content providers and handling the presentation of the (combined) services to the customers including providing the terminal or set-top box and software. Telephone companies have a seductive tool, their presence in the home, and they are not properly using it."

Lost remote controls? Magnavox has feature in new line of TVs that causes the remote control to "sound off" whenever the master power switch on the TV set is turned off and then on again. Following the sound should lead the consumer to the misplaced remote. Now "Remote Finder" is a new add-on device available in US at NZ$41. A special 'docking station pad' is part of the package and each time the remote is lifted from the 'pad' the user has 16 seconds to return the remote to the pad before the remote begins to 'beep'.

US consumer electronics industry set all time sales records during 1994. Colour TV sets to dealers sold more than 27,000,000 units, up a full 10% from previous best year (1993). Leading growth area was projection TVs (up 36.7%), VCRs were up 5.1%. Camcorders were up but only by 3.3% while Laserdisc players fell off by 5.2%. Sales records, however, began to slow down in November and December, and in January sales losses are reported dropping industry back to a level of 1992 sales.

Packard Bell remained largest supplier of personal PC units to US market during 1994 with shipments totalling 2.1 million; significantly up from 1m units in 1993. Firm is believed to have approximately 50% of total US PC market volume and although it once was minor player in home television and electronics equipment, is otherwise unknown in US marketplace.

Sharp has demonstrated three dimensional television displays that do not require special viewing glasses in London. Developed at Sharp's Oxford :Labs, system uses identical LCD panels superimposed into sandwich that has slight offset between layers. No marketing plans have been announced; 9 patent applications have been filed.

Chinese TV set manufacturers produced 27.9 million units during 1994, up 10.1% from 1993. China's black and white sets continued to outpace their colour models by a 3,000,000 set margin. Average value at factory of colour TVs exported was NZ$199.65.

What the New Digital Videodiscs Will Be Like

Although Walt Disney Studios is requesting the all discs be sold in 'caddy' carrier, to protect disc surfaces against accidental damage or spillage of liquids that could impair discs, the most likely scenario is for discs to be very similar to existing audio CDs in physical appearance without 'caddy'.

a) 10 Gb (gigabyte) capacity on two sides, 50% each side

b) 1.2mm thickness, double sided, 5" diameter, from twin 0.6mm thick single sided discs bonded together

c) Average running time per side of 142 minutes at nominal 4.69 M/bps playback rate

d) Dolby AC-3 audio with 3 language channels and four subtitling channels (allowing single disc to be marketed into multiple language markets without customising for single format-single market use)

e) Optional use of Digital Theatre Systems (DTS) sound for large screen display use

f) Disc reading with 635-nm red laser diode pickup

g) Variable rate bit technology that adjusts M/bps readout speed to encoded data that in turn is subject to speed of original material changing imagery between sequential frames

h) Entire DVD player to be reduced to three custom chips in consumer units

i) First anticipated availability: Simultaneous world-wide release 3rd or 4th quarter 1996

j) Retail list price to consumers of US$500 but stiff competition from numerous first-in suppliers likely to create discount pricing to under US$400 after initial 30-60 day period

k) Retail sell-through pricing on DVD discs in range of US$30 / NZ$49.50 with only marginal discounting likely within first year.

l) Minimum of 250 separate movie titles initially available with most major studios planning full library availability on DVD within three years

m) DVD discs will be 'backward compatible' to accommodate existing (pre DVD) CDs and laserdiscs

n) What's next? Blue-laser, shorter wavelength readout for HDTV discs using same size and format

In 1994 US market rented US$12B in films during year with 35% of all US households renting an average of 3 movies each, per week. 'Sell through' represented US$6B industry with 600 million cassettes sold in 1994. In Europe during 1994, video rentals dropped between 33 and 50% as DTH satellite services created major competition causing many in European video industry to forecast major financial losses in years ahead.

DVD system will incorporate copy protection circuits to reduce if not eliminate possibility that digital discs might be used to produce additional discs or analogue tape copies in violation of copyright protection. Projected raw costs for manufacturing DVD discs are in region of 20-25% in excess of standard audio CD costs.

Chinese response to threatened tariff increases for products shipped to US, unless China clamps down on audio and video programme replication piracy, brought some response within China. Officials there claimed they had shut down 100 illegal CD manufacturing facilities, confiscated 50,000 "illegal" CDs and issued rule that all CD manufacturers must register with central government by 1 April or risk being closed down. China had recently adopted tough, new copyright protection law but according to US monitors "*was ignoring the law and allowing small and medium sized firms to duplicate copyrighted materials with impunity*." China has until February 26th to comply with US demands or face stiff tariffs on many consumer products. Next on the copyright hit-list; illegal duplicators thought to be operating in Thailand and Malaysia

Philips has brought out 30"/762mm wide colour CRT for use with computers giving new meaning to "Windows" programme users. The super-large display screen allows side by side display of full size print pages for publication layout and Pagemaker applications.

Hitachi has begun shipping "wireless camcorder" into European market using infrared beam transmitting FM video and stereo audio signal to adapter equipped TV set within "line of sight" range of the camcorder. Unit has suggested user retail of NZ$2,990 with monochrome viewfinder, NZ$3,550 with colour viewfinder.

Lowest price camcorder (US$499.99) has been brought to North American market by Sanyo. Palm-sized VM-PS12 model has optical viewfinder, 3X zoom lens, 1/4" CCD with 270,000 pixel resolution. On plus side, unit uses fuzzy logic for shutter speed and white balance and has large back of unit LCD display to advise user of camcorder modes and functions engaged.

Thorn EMI has shut down all retail consumer electronic outlets in UK closing 285 Rumbelows and 36 Fona stores. Overall UK consumer electronics outlet picture remains dismal: Scottish based Clydesdale has collapsed, Dixons reported disappointing sales and profits and Comet, UK's 2nd rankled retailer behind Dixons, said their sales were off more than 10% for 23 week period ending in mid January.

Franklin Electronic Publishers is opening subsidiary in Sydney during March. The facility, to employ up to ten people, will be Franklin's fifth. Firm produces directories, reference materials on disc for medical and merchandising fields.

Konica will begin supplying Photo Minidisc (MD) service at outlets in September. Proprietary system scans colour photos in 7 seconds and stores on 2.5" minidisc. Single disc can store up to 200 colour pictures with 1,024 x 1,536 dot resolution. System will allow consumers to take their photos to Konica centre for placement on disc and then take disc home (or use in store PC) to size, zoom and manipulate.

How Telecom Parent Bell Atlantic Has Set Up Video Dialtone Programmer Pricing

Possible 'model' that could be followed by New Zealand Telecom for charging programme providers for access to and use of hybrid fibre / coaxial network is found in recent fees established in Dover Township, NJ by BA.

1) VDT network has 384 'channels' each with 6 M/bps capacity (adequate for all but fastest motion sporting events using MPEG 2 format)

2) Programmers elect to use a single 'channel' or channels in groups of 24 (144 M/bps total capacity)

3) There is initial one-time charge of US$250 for programmer to establish service connection into system

4) Programmers pay US$0.05 per potential home (i.e., number of homes connected to system), per channel, per month when providing month to month service for one-way (outward transmission only) service

5) Programmers requiring two-way (interactive) text messaging must purchase 'message port' at US$325 per month following initial US$175 installation charge (pay per view will require this)

6) Multiple channel programmers can interconnect up to 96 channels from programmer location to VDT 'headend' at charge of US$1,700 per month plus US$13 per mile of transport between provider and 'headend'.

Programmers can operate 'advertiser supported', 'institutional' or pay per view / use programming services. B-A supplies the distribution system and in-home set-top decoder and programme access controller box to each customer. The programme provider establishes his own fees and does his own marketing.

Under US regulations, B-A is basically functioning as a 'common carrier' by providing a network with bandwidth which programmers and information providers may engage on a fee schedule to reach potential users. In Virginia VDT system, B-A has also established monthly fee of US$7.50 per home for privilege of being connected to the VDT network.

CABLE/FIBRE TV

Telecom New Zealand's study of a sizeable rollout of fibre optic/coaxial cable hybrid "entertainment programme distribution" is reported to be in final 90 day research period. A design standard for serving densely populated regions, using fibre optic trunking to neighbourhood nodes that will serve between 400 and 600 homes/residences has evolved. Several suppliers including Scientific Atlanta and General Instruments have been alerted to a possible series of RFQs (request for quotations) to begin as early as June of this year. One major policy area still undecided: Will Telecom itself be a programme provider or will it lease transmission channel capacity to programmers and act only as a 'communications transportation' company? Parent Bell Atlantic in systems now being installed in the states of Virginia and New Jersey has struck a halfway stance offering both channel capacity and its own programming.

Cyberstar, a US backed corporation funded by cable operators from the state of Wisconsin, is proposing an extensive cable TV system for the northern shore of South Island, centred on Nelson. They are suggesting 18 channels of cable programming and are considering a hybrid fibre optic plus coaxial cable network. The US firm, Star TV Group, has sent several representatives to New Zealand to study the cable possibilities here and an application for Network Operator (status) is on file with the Ministry of Commerce. Star TV operated multiple cable TV systems in the United States with approximately 250,000 cable subscribers but sold the cable properties recently.

Kiwi Cable's shift in ownership that brought Denver (Colorado) based UIH in for approximately 50% in stake holdings has resulted in a new system manager; Jack Matthews. He comes to New Zealand from a broadly based business background including a management position with the (US) 'Playboy' (pay cable) programme channel. Kiwi Cable reports their major line extension into the community of Waikanae is now ready to 'turn on' and a new potential subscriber base of 1,000 homes is being added to the existing 600 subscriber base in the Kapiti area. Kiwi Cable's system to date has been installed primarily overhead using local electrical utility poles and many areas of Kapiti with buried utilities still do not have cable service available.

Australian government has determined that cable systems proposed by joint venture of Optus Communications and (US) Continental Cable can charge so-called "commercial rates" to programming companies who plan to lease channel capacity to reach consumers connected to cable systems. This decision opens new revenue stream for the proposed system and increases its chances of financial success. Optus Vision is owned 47.5% each by the two with an additional 5% in hands of Publishing & Broadcasting Group. A 3,000,000 home super network of systems is planned at a cost of NZ$3.7B.

Time Warner (part owner of Sky Network) and US West (regional telephone company in US) will own 15.4 and 17.9% respectively of new TITUS Communications in Japan. Firm has Japanese partners including Toshiba, US$28m pledged in start-up capital, and has applied for cable TV franchises to pass 710,000 homes primarily in Tokyo region.

Ameritech, owner of 12.5% of Sky in New Zealand, in partnership with BellSouth and Southwestern Bell has completed agreement with Walt Disney Company to develop new digital video services operation with US$500m investment over the next five years. All three US telephone firms realise that if they are to compete with established cable TV programmers which may largely be unavailable to them for their own hybrid fibre and coaxial networks, they must develop their own competitive programming. Bell Atlantic, another 12.5% owner of Sky here, had reached a similar decision along with Nynex and Pacific Telesis last October and is already creating its own video services programming division.

Video on demand (VOD) test conducted in upper New York state by Rochester Telephone (RT) has concluded earlier than planned with discouraging report. RT says tests convinced them that VOD in its present hardware configuration and backed up by currently available software "*is not economically viable.*" Test was loaded heavily towards movies and music videos on demand and only token use of interactive shopping. RT concluded announcement with notation "*We have a long way to go before services requested by customers are available.*" System used digital compressed video as delivery format.

Bell Atlantic has filed (required) request for FCC approval of video dialtone (VDT) rates it proposes to charge users of hybrid fibre / coaxial network in state of Virginia; US$7.50 per month to be "connected" to service followed by a per programme charge for each programme 'rented' by viewer.

Nynex (telephone) has gained FCC approval for commercial (non-test) VDT system to pass 390,000 homes in eastern Massachusetts and Rhode Island. Hybrid fibre / coax system will have capacity for up to 800 digital channels plus 21 analogue channels. The analogue channels will carry nominally free to air services already available to most residents via off air television reception. How system will be priced to users has not been announced.

Four major US cable firms (TCI, Cox, Continental and Comcast) have formed Cable USC which is designed to work with electric, water and gas utility companies to create unified approach to using cable TV service lines as remote meter reading and service control system. Cable has long claimed the ability, using two-way interactive technology, to assist (for a fee) public utility companies and to reduce or greatly eliminate the costs faced by utilities in reading meters and performing other routine system check and monitoring functions. Cable USC will put cable research money into the creation of suitable hard and software to create this system.

TERRESTRIAL BROADCASTING

Australian launch of Optus B1 delivered pay TV service built around Prime Sports service is being limited to delivery via terrestrial MDS systems in major markets (including Adelaide, Perth, Brisbane, Canberra and Sydney) until July. The Digicipher I NTSC format service is presently being sold at a user cost of A$299 installation and A$50 per month; reports from Australia say although service is being widely advertised, take up has been slow to date and reception of MDS signals is proving to be very difficult in irregular terrain in Sydney area. Conversion to Digicipher II, which will allow PAL format service in place of the present NTSC service, will replace the present format in July. At that time operator Australis / Galaxy will begin marketing the service using DTH (direct to home) satellite delivery in addition to the presently available MDS availability. MDS receive sites taking the Optus B1 (TR10/11H) feed have installed NTSC-PAL standards converters at each MDS transmitter site to allow the service to be reradiated on MDS in PAL format. Australis Media is in the process of raising NZ$315m through issuance of notes in the United States to pay for its MDS and satellite licence costs in Australia.

Gisborne UHF 'Tourism Channel' television station is operational with transmitting antenna atop roof of Gisborne Media Centre. The UHF station is carried by motels and hotels in the region and in format originated by Geyser TV in Rotorua and duplicated by others in Hawkes Bay and Queenstown provides "what to see, where to go" information on tape loops that repeat every 20 minutes between 6AM and 4PM daily.

Rotorua Geyser TV is boasting 60% of homes within its UHF transmitter coverage area are now UHF equipped; perhaps in large part due to sales results for Sky in area but helpful to Geyser none the less. Station uses, with permission, daily German TV news programme feed (1PM) which it receives on 7m dish at studios from Intelsat 180 and also programmes, again with permission, various 'World Net' specials received on I180 as well. Stations bread and butter continues to be looped tourism information which is now distributed by all local motels with excellent sales results.

SKY's commercial (motel) customers are able to add the new Orange Channel and Discovery (plus trackside) at their existing contract rates until contracts expire. Some motels will receive up to 11 months of the five channel service, at the three channel rates, while others with earlier expiring contracts are having to elect their 'level' of service much sooner. Effective 1 March Sky home subscribers will pay an extra $1.50 per month for the two new channels, or, $1.00 each if only one is selected with the original three channel package.

Philips ghost cancelling "ImageLock" system which was tested in New Zealand by BCL this past June and July is being delayed in the consumer pipeline. The system uses a VBI transmitted reference signal that allows a receiver equipped with special IC and circuit to reference each frame of each image to determine whether a secondary image ("ghost") is present. Any ghosting detected causes the IC to electronically cancel the extra image(s) and cleans up multi-path reflections which are bothersome in many areas of New Zealand. TVNZ has stated that the development of the ghost cancellation system is considered "*the most important advance in television reception in New Zealand in more than a decade.*" However, we will have to wait until at least the middle to end of the third quarter of this year as the special IC's required for the receivers are not going to be available in quantity until early spring here. The first units to be sold, in late 1995, will be set-top tuner-adapters at around NZ$500. Philips says they will have ghost cancelling circuits inside of their 1997 model TV receivers at premium prices of NZ$70 to $125.

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